

PO Box 1749 Halifax, Nova Scotia B3J 3A5 Canada

Item No. 11.4.1

Halifax Regional Council April 8, 2008

TO:

Mayor Peter Kelly and Members of Halifax Regional Council

SUBMITTED BY:

Mr. Fred Morley, Chair

Regional Planning Advisory Committee

DATE:

March 28, 2008

SUBJECT:

HRM Climate SMART Climate Change Risk Management Strategy

ORIGIN

March 26, 2008 meeting the Regional Planning Advisory Committee.

RECOMMENDATION

The Regional Planning Advisory Committee recommends Halifax Regional Council endorse the Climate Change Risk Management Strategy as a climate change impact reference and resource document towards the development of the Potential Hazards to Development Functional Plan.

DISCUSSION

The Regional Planning Advisory Committee considered this matter at their March 26, 2008 meeting and approved the recommendation found above.

BUDGET IMPLICATIONS

The budget implications associated with the recommendations have not yet been identified. Any associated budget implications would need to be determined by HRM staff and disclosed to Regional Council in a subsequent report.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation.

ALTERNATIVES

None suggested at this time.

ATTACHMENTS

1. Staff report dated March 4, 2008.

Additional copies of this report, and information on its status, can be obtained by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Sandra Riley, Legislative Assistant



PO Box 1749 Halifax, Nova Scotia B3J 3A5 Canada

> Regional Plan Advisory Committee March 19, 2008

TO: Chair and Members of the Regional Plan Advisory Committee

SUBMITTED BY:

Cathie O'Toole, Director, Infrastructure and Asset Management

DATE: March 4, 2008

SUBJECT: HRM Climate SMART Climate Change Risk Management Strategy

ORIGIN

- March 30, 2004 Information Report Climate Change and GHG Reduction Strategies
- March 8, 2005 Corporate GHG Emission Plan and Climate Change Strategy Update
- September 1, 2005 Corporate GHG Emissions Local Action Plan
- May 9, 2006 Community GHG Emissions Plan

RECOMMENDATION

It is recommended that the Regional Plan Advisory Committee forward a recommendation to Regional Council to endorse the Climate Change Risk Management Strategy as a climate change impact reference and resource document towards the development of the **Potential Hazards to Development Functional Plan**. This is listed as Functional Plan E-21 in the Regional Plan.

BACKGROUND

Sustainability is one of the greatest challenges facing every Canadian municipality and climate change is the biggest sustainability challenge.

Regional Council's approach was to include "healthy, sustainable, vibrant communities" as one of the four corporate operating themes a few years ago.

Staff responded with an integrated systems approach to clean air, land, water and energy, including climate change.

Climate SMART (Sustainable Mitigation and Adaptation Risk management Tool) Climate SMART is an HRM led collaborative partnership involving all three levels of government and the private sector that takes an integrated approach to climate change mitigation and adaptation.

Climate SMART is nationally recognized and was a recipient of an FCM national Sustainable Communities Award.

DISCUSSION

Over the past 2-3 years, most of the Climate SMART plans and tools have been put in place including:

Mitigation

- Corporate GHG Plans
- Community GHG Plans
- Cost Benefits
- Communications

Adaptation

- Developers Risk Management Guide
- Vulnerability Assessment
- Cost Benefits
- Climate Change Impact Guide for Residents

Completed but not endorsed by Regional Council:

- HRM Climate Change Risk Management Strategy

Climate Change Risk Management Strategy

As discussed in the "Implications" section of the attached "Executive Summary", the Climate Change Risk Management Strategy, a key deliverable of Climate SMART, is the culmination of extensive multi-disciplinary internal meetings and previously completed components such as the Vulnerability Risk Assessment.

The Climate Change Risk Management Strategy (200 pages) provides HRM decision makers with an approach to adapt to the changing climate, that is, to minimize risks from climate change.

These adaptation measures can take many forms including planning tools, design tools, legal tools, infrastructure changes, and changes in behavioural patterns.

Recommended Actions

In addition to implementing a risk management strategy, a number of enabling priorities were identified during the Climate SMART project that need to be in place prior to implementing specific adaptation measures. These key enablers are listedunder "Recommended Actions" in the attached Executive Summary.

Several of the enablers are concurrently underway such as leveraging partnerships, LIDAR mapping, enhancing community outreach, life cycle assessments to include climate change considerations, incorporate climate change considerations into our asset and infrastructure management plans, etc.

The Climate Change Risk Management Strategy helps provide one of the detailed reference documents that will be required towards the development of the Regional Plan, Hazards Functional Plan.

BUDGET IMPLICATIONS

There are no budget implications with the approval of this recommendation.

Future climate change mitigation and adaptation measures requiring municipal funding would come before Regional Council as required.

FINANCIAL MANAGEMENT POLICIES / BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Capital and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Capital and Operating reserves, as well as any relevant legislation.

Regional Plan Compliance

Climate SMART and its tools and plans supports the Regional Plan.

Sustainability Compliance

Climate SMART is a key component of HRM's integrated systems approach to clean air, land, water and energy.

ALTERNATIVES

N/A

ATTACHMENTS

Excerpts and Executive Summary from the Climate Change Risk Management Strategy

HRM Climate SMART Climate Change Risk Management Strategy Regional Plan Advisory CommitteeReport - 4 -

March 19, 2008

A copy of this report choose the appropriat 490-4208.	t can be obtained online at http://www.halifax.ca/council/agendasc/cagenda.html then the meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax
Report Prepared by:	Stephen King, Manager, Sustainable Environment Management Office, 490-6188
Report Approved by:	Cathie O'Toole Director Infrastructure and Asset Management, 490-4825

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- Halifax Regional Municipality (HRM policy; operations; communications; document review and guidance)
- Environment Canada Climate Change Section (statistical climate model downscaling; climate change data tools; GIS mapping);
- Inter-Cultural Development Innovations (web site development; community action guide);
- CEF Consultants (land use planning; regional plan review);
- CBCL Limited (land use planning; regional plan review);
- Marbek Resource Consultants (cost/benefit assessment); and
- GeoNet Technologies Inc. (coastal inundation mapping; Coastal DSS®).

Disclaimer

These documents are for guidance purposes only. Information contained in the documents is based on current knowledge of projected climate changes that may affect Halifax Regional Municipality and professional judgment of the potential impacts of climate change on socioeconomic and environmental components described. The projected climate changes and potential impacts are subject to change as climate change science evolves and the user should satisfy themselves with currency of the data. No guarantees are implied by Halifax Regional Municipality, the Government of Canada, the Province of Nova Scotia or the authors.

Executive Summary

Background

According to the Inter-Governmental Panel on Climate Change (IPCC) and other leading climate change researchers, climate change is impacting and will continue to affect the health and well being of people and communities throughout the world even if global greenhouse gas emissions are reduced to the Kyoto Protocol target levels. If left unmitigated, these climate changes are likely to exceed the capacity of natural, managed and human systems to adapt¹. Furthermore, one of the world's largest reinsurers, Munich Re, states:

"Climate change will significantly increase the frequency and severity of heatwaves, droughts, bush fires, tropical cyclones, tornadoes, hailstorms, floods, and storm surges in many parts of the

Globally, estimates of the annual cost of climate change impacts range from \$300 billion to over \$2,000 billion.

December 2007

world."

Globally, estimates of the annual cost of climate change impacts range from \$300 billion to over \$2,000 billion. While there is no consensus that either Hurricane Juan that affected Nova Scotia, or Hurricane Katrina that devastated New Orleans and other Gulf Coast communities were caused by climate change, the devastating physical, health, and social impacts may foretell the type of impacts on vulnerable coastal communities that are likely to become more frequent in the future as a consequence of global climate change. Halifax Regional Municipality (HRM) has been witness to the physical and social impacts of extreme weather, notably Hurricane Juan in September 2003, and the one-metre snowfall and high winds experienced during the 'Great Maritime Blizzard' of February 2004. These extreme events significantly impacted the region, and severely impacted the region's electrical and communications infrastructure as well as impeding public access to health and emergency service facilities throughout the Province of Nova Scotia but most particularly here in the HRM.

The Conference Board of Canada in a recent briefing note² concluded that there as been a lack of discuss on how Canada will adapt to climate change. In addition, the Conference Board concluded that adaptation is not currently a basic consideration in infrastructure or corporate decision making. Because it is a public trust responsibility to do so, adaptation should become as germane to policy and development discussions as public safety and security are today.

In response to HRM's experience with extreme events and the projections that indicate these events are expected to be become more frequent, the Sustainable Environment Management Office (SEMO) in collaboration with members of ClimAdapt (a network of private sector companies in Nova Scotia that provide climate change adaptation expertise) partnered with, the Federation of Canadian Municipalities, Natural Resources Canada, Environment Canada and the Province of Nova Scotia to develop an approach that could be implemented to reduce HRM's contribution to greenhouse gases and manage the impacts of climate change. The result of this initiative was Climate SMART (Sustainable Mitigation and Adaptation Risk Toolkit) with the overall objective of mainstreaming climate change into municipal decision making.

This initiative is helping HRM achieve its goal of being a leader in the mitigation of pollutants to the environment and adaptation to climate change by providing direction on the incorporation of climate change risk management and adaptation in future corporate business unit plans. The project will provide HRM with tools to assess vulnerability and to adapt to climate change and supports HRM's overall corporate goal of a Healthy, Sustainable, Vibrant Communities theme.

² Operationalizing Adaptation to Climate Change. February, 2007. 7 pp.

December 2007

Projected Climate Changes for HRM

Based on Environment Canada modeling to date, within the next 80 years climate change impacts on HRM are projected to include:

- an increase in mean temperature from 2° to 5°C, more days above 30°C, longer heat wave duration;
- a decrease in days with temperatures below -10°C;
- longer frost free season;
- increase in precipitation by up to 12% and an increase in rainfall intensity;
- a rise in sea-level of between 50 and 88 cm;
- an increase in peak wind speeds associated with tropical cyclones; and
- introduction of new and exotic pasts.

Implications

The Inter-governmental Panel on Climate Change (IPCC) has concluded that where extreme weather events (floods, droughts, heat-waves, storm events) are expected to become more intense and/or more frequent, the economic and social costs of those events will increase. These increases will be substantial in the areas most directly affected, e.g. areas susceptible to coastal inundation, and the impacts will have a trickle down effect spreading from directly impacted areas and sectors to other areas and sectors indirectly through, environmental, economic and social linkages.

Overall, HRM is vulnerable to climate change due to its coastal location and the significant role played in the economy by transportation; health services; forestry; and fishing. The majority of HRM's infrastructure and population is based on the coastline and the municipality has numerous areas of susceptibility to coastal erosion and inundation.

The vulnerability assessment component of the strategy determined a number of key HRM sectors or aspects have the potential to be impacted by the above climate changes including: coastal zones; communities; infrastructure; water resources; human health; fisheries; forestry and agriculture; and environment/ecosystems.

Furthermore, this impact will have a direct effect on a number of HRM's business units, including: Transportation and Public Works (road maintenance); Infrastructure and Asset Management (coastal road infrastructure; recreational park management); Community Development (projected impacts will require possible changes to land uses); Fire and Emergency Services (will be required to respond more often due to extreme events; Communications (dissemination of information on how to adapt to climate change); Legal Services (possible bylaw revisions; inclusion of climate change in risk management protocols); and Halifax Regional

December 2007

Water Commission (water quality; stormwater design; dam management).

Understanding these vulnerabilities allows prioritization of what actions to be taken. To that end, one of the key deliverables of the Climate SMART (Sustainable Mitigation and Risk Tool) project is the development of a climate change *risk management strategy*. This strategy provides HRM decision makers with an approach to adapt to the changing climate, that is, to minimize risks from climate change. These adaptation measures can take many forms including planning tools, design tools, legal tools, infrastructure changes, and changes in behavioral patterns.

Recommended Actions

The IPCC suggests that the best approach to addressing climate change impacts is a mix of strategies that includes mitigation (such as HRM's GHG Reduction Plans), adaptation, technological development (to enhance both adaptation and mitigation), research (on climate science, impacts, adaptation and mitigation), and education. This approach needs to combine policies with incentive-based approaches, and actions at all levels from residents through to provincial and federal governments.

A key barrier against the incorporation of climate change in decision making is that municipalities and private enterprise are unsure of or do not know how to assess the risks of climate change as rigorously as risk assessment for other risks such as commercial or security risks³. This *risk management strategy* provides HRM with the information necessary and the protocols to assess risks from climate change by adapting risk management guidance from other jurisdictions such as Australia and the Caribbean to HRM.

In addition to implementing a risk management strategy, a number of enabling priorities were identified during the Climate SMART project that need to be in place prior to implementing specific adaptation measures. These key enablers include:

- Leverage innovative and responsive funding through external partnerships for climate change adaptation projects.
- Enhance community outreach and education on climate change to encourage participation and prepare stakeholders for possible controls; e.g. land use planning.
- Integrate up-to-date climate hazard mapping and asset inventory for each business unit with LIDAR mapping.
- Incorporate climate change one of the risk considerations into the integrated risk management program being implemented by HRM.
- As part of a life cycle assessment management system include climate change for building assets and groundwater, in particular.
- Continue to enhance inter-governmental collaboration, communication and coordination that integrates HRM's activities with federal and provincial climate change activities and clarifies

³ Ibid.

December 2007

lines of responsibility.

• Update of design criteria to account for climate change impacts.

December 2007

Needs for Future Actions (from external parties)

The assessment highlights the need for additional data to support and improve the risk management capacities of HRM from other jurisdictions, including the federal and provincial governments, as well as universities and non-governmental organizations to facilitate decision making. These data needs include:

- more downscaling of climate change modeling specific to HRM;
- detailed digital elevation model of the vulnerable areas of HRM;
- assessment of the costs of climate change on the economy of HRM;
- development of a monitoring program and indicators to track changes in water quantity and quality;
- design criteria based on forecasting including climate change;
- improved understanding of coastal changes in response to climate change; and
- further research on the response of ecosystems to climate change.